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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,699	12/05/2003	George H. Barlow	1853.001US1	4595
21186	7590	05/27/2005	EXAMINER	
SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.			KRAMSKAYA, MARINA	
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MINNEAPOLIS, MN 55402-0938			2858	

DATE MAILED: 05/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/729,699

Applicant(s)

BARLOW, GEORGE H.

Examiner

Marina Kramskaya

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) 17, 18 and 34-50 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 5, 7-9, 11-16, 19, 20, 22, 23, 25-27 and 29-33 is/are rejected.
- 7) ☒ Claim(s) 3, 6, 10, 21, 24 and 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8/23/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Species I in the reply filed on 3/21/05 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 17-18 & 34-50 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 3/21/05.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 & 19 and 13 & 31 are rejected under 35 U.S.C. 102(b) as being Vranish by 5,442,347.

As per Claim 1 & 19, Vranish discloses an electronic proximity sensing apparatus 12 and a method for sensing comprising:

- at least two pair of signal pads (16, 22), each pair of signal pads comprising a first signal pad 16 and a second signal pad 22, each signal pad connected to receive an electric voltage signal;
- at least two sensing conductors (18, 20) routed between the first signal pads 16 and the second signal pads 20 of the at least two pair of signal pads; and
- a sensor 32 operable to detect the difference in voltage between two (point 34 & 36) of the at least two sensing conductors (see FIG. 4-5).

As per Claims 13 & 31, Vranish further discloses the proximity sensing apparatus, wherein sensing proximity comprises determining whether an object is proximate or not proximate (column 1, lines 59-63).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2 & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vranish in view of Reddi, US 6,366,099.

Vranish discloses the electronic proximity sensing apparatus and method as applied to Claims 1 & 19 above.

Vranish does not disclose electric voltage signals applied to the signal pads to vary inversely to one another.

Reddi discloses electric voltage signals received by the first signal pad **40** and the second signal pad **38** of each pair that vary inversely to one another (see inverse signals **13 & 15**).

Therefore, it would have been obvious to a person of ordinary skill in the art to use electric voltage signals that vary inversely to one another, as taught by Reddi, in the sensor of Vranish, in order to charge the capacitive plates to voltages equal in magnitude but opposite in polarity so that when they become discharged and any residual charge is a direct measure of the difference in their capacitance (Reddi: column 3, lines 38-42).

7. Claims 4 & 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vranish in view of Douglass, US 5,786,979.

Vranish discloses the electronic proximity sensing apparatus and method as applied to Claims 1 & 19 above.

Vranish does not explicitly disclose the two sensing conductors and the signal pads that comprise printed circuit board traces running substantially parallel to one another.

Douglass discloses the sensing conductors (**308 & 316**) comprise printed circuit board traces (ABS., lines 1-4) that are substantially parallel to each other (see FIG. 4), and wherein the at least two pair of signal pads (**402 & 404**) comprise signal pads comprising printed circuit board traces (ABS, lines 1-4) running substantially parallel to one another and to the at least two sensing conductors (see FIG. 4).

Therefore, it would have been obvious to a person of ordinary skill in the art to position the two sensing conductors and the signal pads that comprise printed circuit board traces running substantially parallel to one another, as taught by Douglass, in the sensor of Vranish, in order to couple a plurality of chips with ease, forming additional signal pads and sensing conductors.

8. Claims 5 & 23, 14 & 32, and 15 & 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vranish in view of Lambert, US 6,724,324.

As per Claims 5 & 23, Vranish discloses the electronic proximity sensing apparatus and method as applied to Claims 1 & 19 above.

Vranish does not disclose separating the sensing conductors by a ground conductor at a ground potential voltage.

Lambert discloses the two sensing conductors (**12 & 14**), in a proximity sensor **10**, that are physically separated by a ground conductor **16** at a ground potential voltage (see FIG. 1).

Therefore, it would have been obvious to a person of ordinary skill in the art to separate the sensing conductors by a ground conductor at a ground potential voltage, as taught by Lambert, in the sensor of Vranish, in order to isolate the conductors.

As per Claims 14 & 32, Vranish discloses the electronic proximity sensing apparatus and method as applied to Claims 1 & 19 above.

Vranish does not explicitly disclose the electronic proximity sensing apparatus operable to determine a varying degree of proximity of an object. However, Vranish discloses detection of an object at a great range (column 2, line 22).

Lambert discloses a proximity sensing apparatus, wherein sensing proximity comprises determining a varying degree of proximity of an object (see FIG. 17, for the voltage v. distance of object graph).

Therefore, it would have been obvious to a person of ordinary skill in the art to use the proximity sensor to determine a varying degree of proximity of an object, as taught by Lambert, in the proximity sensor of Vranish, in order to notify the user how far an object is from the sensor, as in the example given for FIG. 11 in Lambert, to prevent vehicle door collision with a person or other objects.

As per Claims 15 & 33, Vranish discloses the electronic proximity sensing apparatus and method as applied to Claims 1 & 19 above.

Vranish does not explicitly disclose evaluation of proximity sensing data from at least two of the at least two pair of signal pads to provide an interpolated detected proximity location.

Lambert discloses a proximity sensor, wherein evaluation of proximity sensing data from at least two of the at least two pair of signal pads (12 & 14) provides an interpolated detected proximity location (see FIG. 17, for the voltage v. distance of object graph).

Therefore, it would have been obvious to a person of ordinary skill in the art to use the proximity sensor to determine a proximity location of an object, as taught by Lambert, in the proximity sensor of Vranish, in order to notify the user how far an object is from the sensor, as in the example given for FIG. 11 in Lambert, to prevent vehicle door collision with a person or other objects.

9. Claims 7 & 25 and 12 & 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vranish in view of Binstead, US 6,137,427.

As per Claims 7 & 25, Vranish discloses the electronic proximity sensing apparatus and method as applied to Claims 1 & 19 above.

Vranish does not explicitly disclose the electronic proximity sensing apparatus comprising part of a position selector apparatus, and wherein each pair of signal pads represents a position of the position selector apparatus.

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Binstead discloses the electronic proximity sensing apparatus **10** comprises part of a position selector apparatus (column 1, lines 45-55), and wherein each pair of signal pads (**12 & 14**) represents a position of the position selector apparatus (i.e. position on a touchpad system).

Therefore, it would have been obvious to a person of ordinary skill in the art to use the proximity sensor as part of a position selector apparatus, as taught by Binstead, in the sensor of Vranish, in order to allow the user to select a desired input on a touch screen.

As per Claims 12 & 30, Vranish discloses the electronic proximity sensing apparatus and method as applied to Claims 1 & 19 above.

Vranish does not explicitly disclose the proximity sensing apparatus that comprises multiple proximity sensing apparatus configured to form a two-dimensional touchpad proximity sensing apparatus.

Binstead discloses the proximity sensing apparatus that comprising multiple proximity sensing apparatus configured to form a two-dimensional touchpad proximity sensing apparatus (column 1, lines 45-55).

Therefore, it would have been obvious to a person of ordinary skill in the art to use the proximity sensing apparatus as a two-dimensional touchpad, as taught by Binstead, in the proximity sensor of Vranish, in order to allow the user to select a desired input on a touch screen.

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10. Claims 8 & 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vranish in view of Piguet et al., US 4,242,676.

Vranish discloses the electronic proximity sensing apparatus and method as applied to Claims 1 & 19 above.

Vranish does not explicitly disclose at least two visual indicators associated with the at least two pair of signal pads, the visual indicators configured to provide visual indication of signal pads actuated by proximity sensing.

Piguet discloses at least two visual indicators (**111'** & **110**) associated with the at least two pair of signal pads (plurality of signal pads **101**), the visual indicators configured to provide visual indication of signal pads actuated by proximity sensing (see FIG. 3).

Therefore, it would have been obvious to a person of ordinary skill in the art to include visual indicators associated with the actuation of the proximity sensor, as taught by Piguet, in the proximity sensor of Vranish, in order to display indication that user input on a touchpad has been entered, as in FIG. 3 of Piguet.

11. Claims 9 & 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vranish in view of Wong et al., US 5,485,292.

Vranish discloses the electronic proximity sensing apparatus and method as applied to Claims 1 & 19 above.

Vranish does not explicitly disclose a circuit coupled to the sensor for comparing the detected voltage difference to an anticipated voltage difference to determine proximity of a capacitive body.

Wong discloses an electronic proximity sensing apparatus, wherein a circuit **88** is coupled to the sensor **86** for comparing the detected voltage difference to an anticipated voltage difference V_{ref} to determine proximity of a capacitive body.

Therefore, it would have been obvious to a person of ordinary skill in the art to couple the voltage difference sensor to a comparison circuit, as taught by Wong, in the sensor of Vranish, in order to compare the detected voltage difference to a reference value to detect variations from normal conditions.

12. Claims 11 & 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vranish in view of Wong as applied to claims 9 & 27 above, and further in view of Lambert.

Vranish in view of Wong disclose the electronic proximity sensing apparatus and method as applied to Claims 9 & 27 above.

Vranish, as modified does not explicitly disclose proximity sensor, wherein the capacitive body is part of a human body.

Lambert discloses a proximity sensor, where the object whose proximity is being detected is part of a human body (FIG. 1).

Therefore, it would have been obvious to a person of ordinary skill in the art to detect the proximity of a human body, as taught by Lambert, in order to protect a

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persons from being hit by a trunk of a car or a door, as in example of FIG. 11 in Lambert.

13. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vranish in view of Davis et al., US 6,218,602.

Vranish discloses the electronic proximity sensing apparatus as applied to Claims 1 above.

Vranish does not disclose using the proximity sensing apparatus in operation of control an audio synthesizer.

Davis discloses an audio synthesizer, wherein the proximity sensing apparatus is coupled to the proximity sensor (i.e. a touch screen) such that the proximity sensor is operable to control one or more synthesizer parameters (column 7, lines 4-9).

Therefore, it would have been obvious to a person of ordinary skill in the art to use a proximity sensor in a synthesizer, as taught by Davis, in the system of Vranish, in order to create a user interface for control of the music system such as a synthesizer.

Allowable Subject Matter

14. Claims 6 & 24 and 10 & 28 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As per Claims 3 & 21, the prior art fails to teach an electronic proximity sensing apparatus and method, wherein the electric voltage applied to each pair of the at least

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two pair of signal pads varies only when the voltage applied to other pair of the at least two pair of signal pads remains substantially constant.

As per Claims 6 & 24, the prior art fails to teach a proximity sensor with three sensing conductors, wherein three sensors are operable to detect three voltage differences in the following configuration:

- a first sensor operable to detect a voltage between a first and a second of the three sensing conductors and to output a voltage signal proportional to the detected voltage;
- a second sensor operable to detect a voltage between the second and a third of the three sensing conductors and to output a voltage signal proportional to the detected voltage; and
- a third sensor operable to detect a difference between the voltages output by the first sensor and the second sensor, and to output a voltage signal proportional to the detected voltage difference.

As per Claims 10 & 28, the prior art fails to teach a proximity sensor, wherein the proximity of a capacitive body is indicated when a detected voltage difference is significantly lower than the anticipated voltage difference.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Meyer, US 5,304,937, discloses a proximity sensor with pairs of

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signal pads and a pair of sensor pads, wherein a sensor is coupled to the sensor pads to detect a voltage difference.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marina Kramskaya whose telephone number is (571)272-2146. The examiner can normally be reached on M-F 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571)272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MK

V. Nguyen

5/26/2005

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PRIMARY EXAMINER

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Examiner
Art Unit 2858

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